Brattin, Bill to: benson.bob 09/16/2010 06:35 AM

From: "Brattin, Bill" <brattin@srcinc.com>
To:

I am trying to figure out the bins you used based on cumulative exposure. It is difficult to read the lscales.
Looks to me like the medians of the 5 bins are close to these:
0.07, 0.13, 0.5, 1, and 12
Am I close?
Or did you use the means?
When I did my groups for the BMD analysis, I used groups of 50 people with 52 in the top group (which I dropped to get a fit based on p value).
Reply: There are 2 basic strategies for creating bins: a) equal number of people, or b) some sort of steps in exposure level. Either approach is arbitrary, and the results depend on the approach (that is bad). That is why fitting to the individual data rather than the binned data is inherently better. However, if we do using a binning approach, I prefer to use the dose-step method. This helps ensure the data points used for fitting are spread out on the x-axis. For any bin, the metric of exposure is usually the average, not the median.
Latency is not time after exposure stops in this analysis. I think this is somewhat different from the usual definition of latency (time after exposure ends)
For a site not very useful for exposure beginning after age 5 to 10
Reply: I am pretty sure that latency is usually timed from the start of exposure, not the end. I am certain this is the definition used in the asbestos cancer modeling. If latency were from the end of exposure, then latency would be zero for anyone with continuous lifetime exposure. If it were assumed that disease required a latency of 5 years, then anyone with continuous exposure would never have disease (obviously wrong).
In fitting the model to the data, we must use the latency of the exposed workers: L = age at x-ray – age at first exposure
In applying the model, we define age at x-ray as 70 . So, L = 70 – age at first exposure.
This allows us to predict risk to a variety of different scenarios (e.g., residential exposure where a person is exposed from age 0-30, worker exposure where a person is exposed from age 20 to 45, etc.). This is why the output of the effort should not be a single RfC, but a table of RfC values that apply to different ages at first exposure.
Would it make more sense to base this analysis on fibers/cc (dividing cumulative exposure in Marysville by exposure duration in years for each individual before the modeling is done) since we are incorporating exposure duration later (age at intial exposure + latency = 70) ?
I think my calculations incorporate duration of exposure twice. Eliminating a duplicate factor would be good!
Reply: In my modeling, the best fits were obtained using CE*L = C * Duration * Latency
I think this makes sense, because it seems intuitive that risk (probability of disease) should depend on each of these 3 terms.
Even though latency (un-lagged) includes the interval when exposure is occurring, I do not think this is a "double counting".
In any event, even if it duration is used twice, there is nothing wrong with a model in which risk depends of time^2. The mesothelioma risk model depends on time ^3.
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